



Spectral Gamma-Ray Borehole Log Data Report

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Borehole

40-10-05

Log Event A

Borehole Information

| | | |
|-------------------------|---------------------------------|----------------------------------|
| Farm : <u>S</u> | Tank : <u>S-110</u> | Site Number : <u>299-W23-204</u> |
| N-Coord : <u>35,880</u> | W-Coord : <u>75,632</u> | TOC Elevation : <u>663.00</u> |
| Water Level, ft : | Date Drilled : <u>3/31/1976</u> | |

Casing Record

| | | |
|----------------------------|--------------------------------|--------------------|
| Type : <u>Steel-welded</u> | Thickness : <u>0.280</u> | ID, in. : <u>6</u> |
| Top Depth, ft. : <u>0</u> | Bottom Depth, ft. : <u>100</u> | |

Cement Bottom, ft. : 105 Cement Top, ft. : 100

Borehole Notes:

This borehole was drilled in March 1976 to a depth of 105 ft. The borehole was started with a 20-ft length of 8-in. surface casing and was completed to a nominal depth of 100 ft using 6-in. casing. The 5 ft of open borehole below the bottom of the 6-in. casing was filled with grout. The 20-ft length of surface casing was removed upon completion of the borehole and the annulus between the 6-in. casing and the portion of the borehole wall drilled with the 8-in. casing was grouted. The casing thickness is presumed to be 0.280 in., on the basis of the published thickness for schedule-40, 6-in. steel tubing. The drilling report does not indicate if the borehole casing was perforated. The top of the casing, which is the zero reference for the SGLS, is approximately flush with the tank farm grade.

Equipment Information

| | | |
|-----------------------------------|---|--|
| Logging System : <u>1</u> | Detector Type : <u>HPGe</u> | Detector Efficiency: <u>35.0 %</u> |
| Calibration Date : <u>04/1996</u> | Calibration Reference : <u>GJPO-HAN-5</u> | Logging Procedure : <u>P-GJPO-1783</u> |

Log Run Information

| | | |
|---------------------------------|----------------------------------|---------------------------------------|
| Log Run Number : <u>1</u> | Log Run Date : <u>07/08/1996</u> | Logging Engineer: <u>Alan Pearson</u> |
| Start Depth, ft.: <u>0.0</u> | Counting Time, sec.: <u>100</u> | L/R : <u>L</u> Shield : <u>N</u> |
| Finish Depth, ft. : <u>25.0</u> | MSA Interval, ft. : <u>0.5</u> | Log Speed, ft/min.: <u>n/a</u> |
| Log Run Number : <u>2</u> | Log Run Date : <u>07/09/1996</u> | Logging Engineer: <u>Kim Benham</u> |
| Start Depth, ft.: <u>98.0</u> | Counting Time, sec.: <u>100</u> | L/R : <u>L</u> Shield : <u>N</u> |
| Finish Depth, ft. : <u>59.0</u> | MSA Interval, ft. : <u>0.5</u> | Log Speed, ft/min.: <u>n/a</u> |
| Log Run Number : <u>3</u> | Log Run Date : <u>07/10/1996</u> | Logging Engineer: <u>Alan Pearson</u> |
| Start Depth, ft.: <u>60.0</u> | Counting Time, sec.: <u>100</u> | L/R : <u>L</u> Shield : <u>N</u> |
| Finish Depth, ft. : <u>24.0</u> | MSA Interval, ft. : <u>0.5</u> | Log Speed, ft/min.: <u>n/a</u> |



Borehole

40-10-05

Log Event A

Analysis Information

Analyst : E. Larsen

Data Processing Reference : P-GJPO-1787

Analysis Date : 04/10/1997

Analysis Notes :

This borehole was logged by the SGLS in three log runs. The pre- and post-survey field verification spectra met the acceptance criteria established for the peak shape and detector efficiency, confirming that the SGLS was operating within specifications. The energy calibration and peak-shape calibration from these spectra were used to establish the channel-to-energy parameters used in processing the spectra acquired during the logging operation.

Casing correction factors for a 0.280-in.-thick steel casing were applied during analysis.

The man-made radionuclide Cs-137 was detected in this borehole. Measurable Cs-137 contamination was detected continuously from the ground surface to a depth of 1 ft.

The K-40 plot shows a region of relatively low concentration values between the ground surface and 18.5 ft. Within this region, relatively higher K-40 concentrations were detected between 11 and 13 ft. A significant decrease occurs in the U-238 concentration values at a depth of 25 ft. A decrease in the K-40 concentration occurs at 46 ft. A region of variable K-40 concentration values was detected between 46 and 55 ft. The K-40 concentration values increase significantly at about 55 ft and remain elevated to the bottom of the logged interval. A peak in the Th-232 concentration values occurs at 67.5 ft.

Additional information and interpretations of log data are included in the main body of the Tank Summary Data Report for tank S-110.

Log Plot Notes:

Separate log plots show the man-made and the naturally occurring radionuclides. The natural radionuclides can be used for lithology interpretations. The headings of the plots identify the specific gamma rays used to calculate the concentrations.

A combination plot includes the man-made and natural radionuclides, the total gamma derived from the spectral data, and the Tank Farms gross gamma log. The gross gamma plot displays the latest available digital data. No attempt has been made to adjust the depths of the gross gamma logs to coincide with the SGLS data.

Uncertainty bars on the plots show the statistical uncertainties for the measurements as 95-percent confidence intervals. Open circles on the plots give the MDL. The MDL of a radionuclide represents the lowest concentration at which positive identification of a gamma-ray peak is statistically defensible.